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Complete Specification Accepted: April 24, 1940.

COMPLETE SPECIFICATION

Improvements in or relating to Speed Adjusting and Limiting Devices Operating with Centrifugal Masses

We, S.P.I.C.A., a body corporate organised under the Laws of Italy, FRANCESCO CASSANI, and GIOVANNI CASSANI, both subjects of the King of Italy, all of 37, Via Bartolomeo Bosco, Genoa, Italy, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to speed governing devices for heavy oil internal combustion engines of the type used in motor vehicles and particularly to governor apparatus of the kind in which the fuel pump controlling member is actuated by a lever having operative connection with the centrifugal governor, said lever also being loaded by an adjustable light spring for controlling idling speeds, the stronger springs of the centrifugal governor for controlling maximum speeds being displaced from their operative connection with the pump actuating lever so that they do not operate during idling speeds but are brought into operation at speeds above idling speeds.

It is the object of the present invention to provide an improved and simplified governor of the above kind in which play between the transmitting members and chattering of the governor weights is avoided at all speeds whilst retaining a high sensitivity of governor control.

According to the invention the governor apparatus incorporates three spring systems, namely a light spring loading the pump control lever and serving to set the lever for idling speeds, stronger springs which are brought into play at higher speeds and determine the maximum speed, and springs interconnecting the weights of the centrifugal governor, the arrangement being such that during idling speeds the weight-interconnecting springs act in opposition to the control lever loading spring whilst during running at high speeds the weight-interconnecting springs and the stronger springs of the centrifugal governor act together in opposition to the said loading spring.

Reference will now be made to the
[Price 1/-]

accompanying drawings which illustrate by way of example a governor according to the invention, and in which:

Fig. 1 is a sectional elevation of a complete governor for two predetermined speeds of the engine,

Fig. 2 is a cross-section thereof, and

Fig. 3 is a detail of the spring for the minimum or idling speed.

In the drawing, A indicates the centrifugal weights, expanding radially from and perpendicular to the governor shaft against the opposition of the main or heavy radial springs B designed for the maximum speed and engaged between a resting shoulder C and an adjustable stop or nut D. On each weight A one arm of a bell-crank lever E is pivoted at A', the other arm of the lever being pivoted at E' on a spindle E'' connected to a lever F transmitting the radial movement of the weights A to the control rod F' of the fuel pump.

The lever F is loaded by a minor leaf spring G, adjustable by a bolt H, and designed for the minimum or idling speed of the engine.

Light springs L are provided between the weights A for the purpose of avoiding the chattering thereof during the running of the engine.

The operation of the device is as follows: The centrifugal weights A are shown at rest in Figure 1; when the engine is idling the control rod F' is held in the position for a minimum fuel injection by the spring G, the weights A being slightly expanded against the action of the springs L but insufficient to contact with the shoulders C. When the engine is running at full speed the weights expand further against the action of the springs B and L, the governor then operating in the usual manner to maintain the speed at a desired maximum, for example 2000 revolutions per minute, by increasing or reducing the fuel supply as the load on the engine causes its speed to fall or rise respectively. Outward movement of the weights A is limited by engagement of a stop I on the collar C with a nut D, the stop I and nut D being so positioned that when they contact fuel is completely cut

off. Thus racing of the engine, due for example to a sudden release of the load, is prevented.

It is to be noted that the spring G is always acting in addition to the springs B and L, thus providing a maximum sensitivity of the governor, the said spring G being capable of fine adjustment by the bolt H, and taking up any wear of the levers so as to eliminate the play between their parts. Moreover the regulating bolt H allows for controlling the speed during idling of the engine.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A speed governing device of the kind referred to wherein there is incorporated three spring systems, namely a light spring loading the pump control lever and serving to set the lever for idling speeds, stronger springs which are brought into play at higher speeds and determine the maximum speed, and springs interconnecting the weights of the centrifugal governor, the arrangement being such that during idling speeds the weight-interconnecting springs act in opposition to the control lever loading spring whilst during

running at higher speeds the weight-interconnecting springs and the stronger springs of the centrifugal governor act together in opposition to the said loading spring. 35

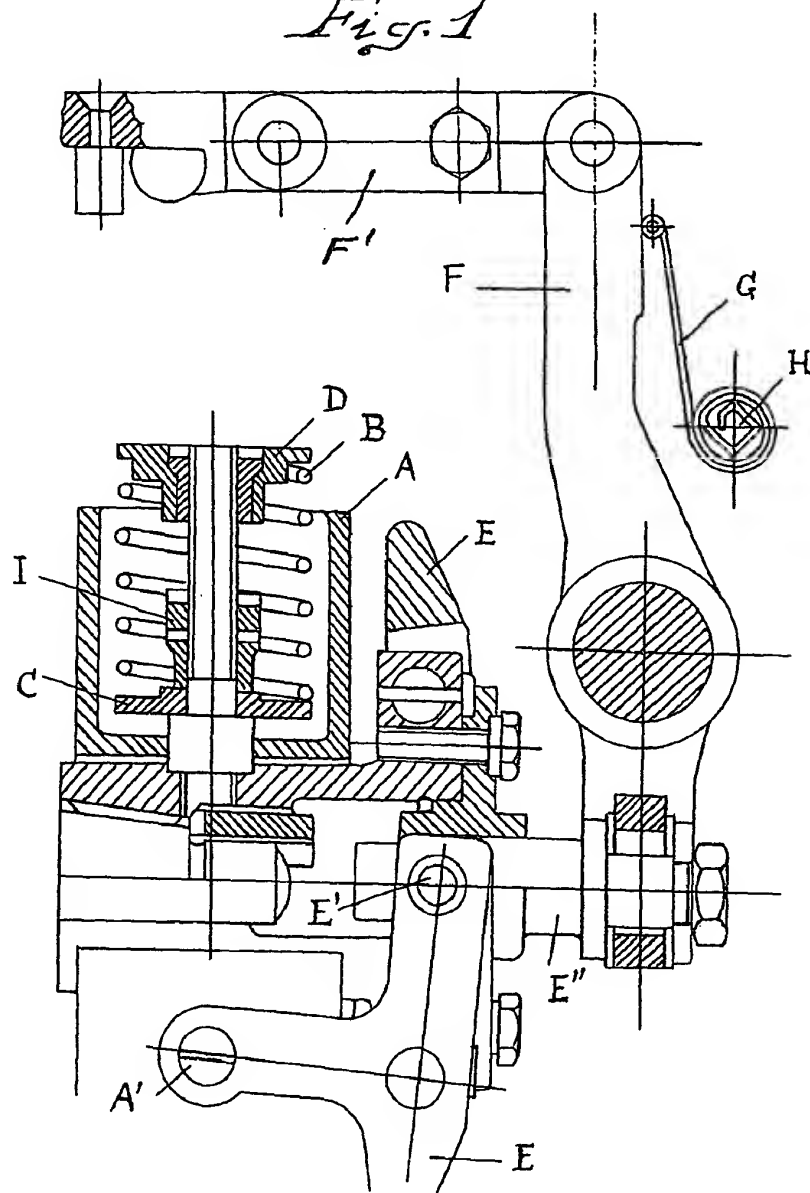
2. A speed governing device according to Claim 1, wherein the pump control lever is loaded by a leaf spring mounted upon a bolt by which it may be adjusted to regulate the idling speed. 40

3. A speed governing device according to Claim 1 or 2, wherein the governor weights are mounted to move radially of and perpendicular to the governor shaft, their movements being transmitted to the pump control lever through bell-crank levers. 45

4. A speed governing device for heavy oil internal combustion engines constructed, arranged and adapted to operate substantially as described with reference to the accompanying drawings. 50

Dated this 15th day of September, 1933.

HERON ROGERS & CO.,
Agents for Applicants,
Bridge House,
181, Queen Victoria Street,
London, E.C.4.

Fig. 1

[This Drawing is a full-size reproduction of the Original.]

HEET 1

Fig. 2

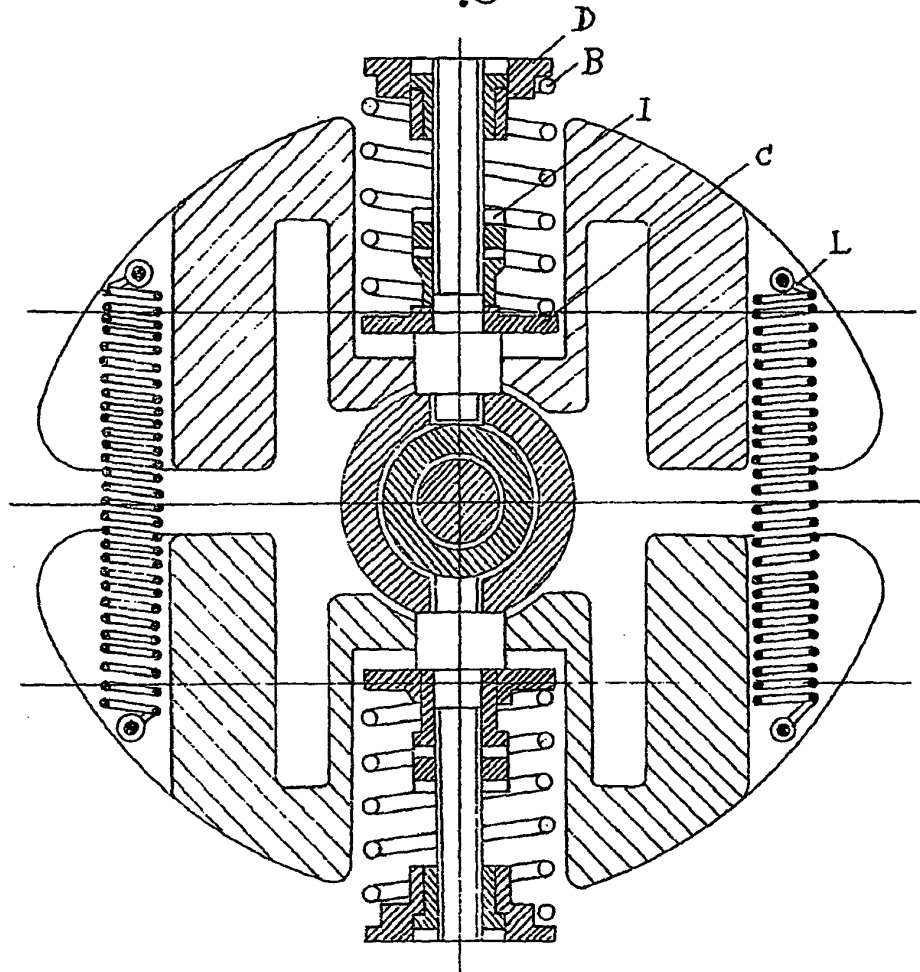
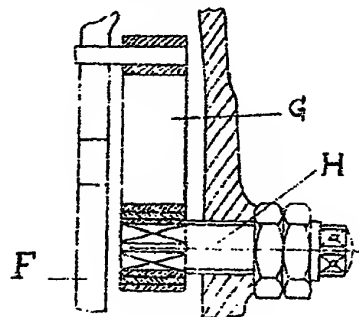
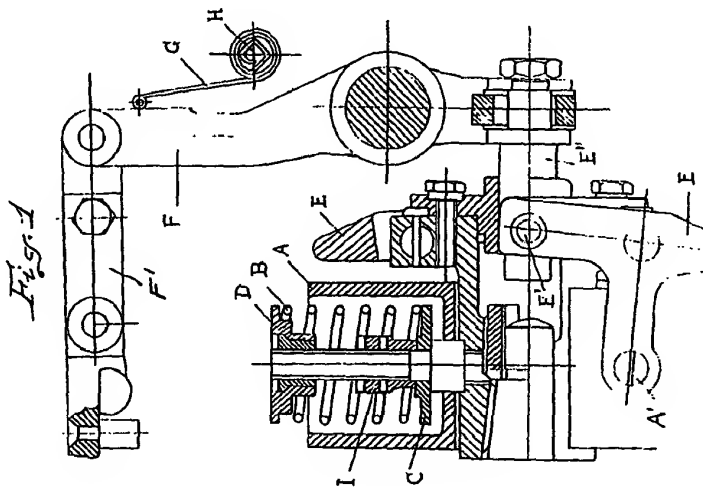
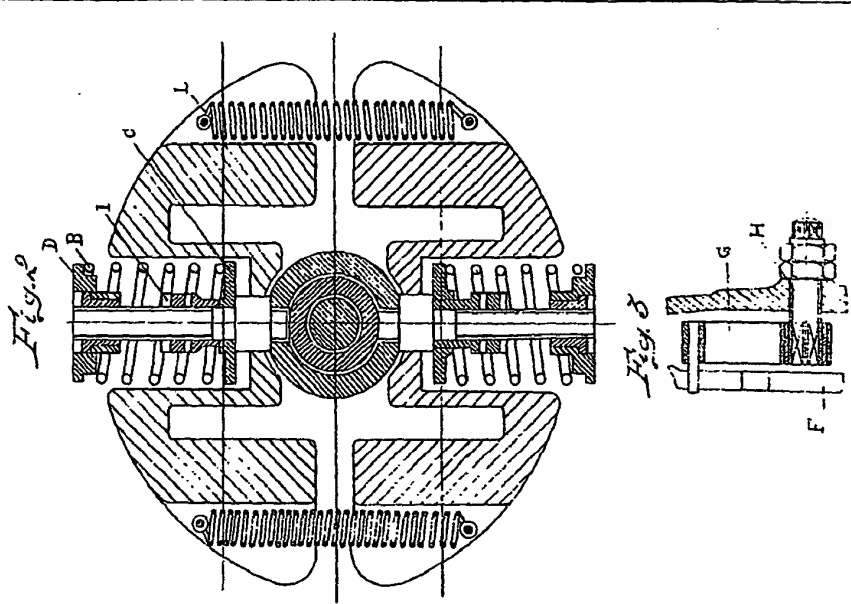


Fig. 3





(This drawing is a full size representation of the Original.)